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CORRESPONDENCE

Familial thrombocytopenia flare-up following the first dose of mRNA-1273 Covid-19 vaccine

To the Editor:

A 36-year-old female with a past medical history of thrombocytopenia, previously classified as immune thrombocytopenic purpura (ITP), presented to the hospital with diffuse petechiae, easy bruising, bleeding gums and a mild headache. She has a history of excessive bleeding after dental procedures but denied heavy menstrual bleeding. She was diagnosed with "ITP" as a child with a baseline platelet count of 40-60 K/μL. Previously, her work up was negative for autoimmune and nutritional disorders. Her family history included multiple generations of both genders reporting similar low platelet counts since birth. Prior evaluations included a bone marrow biopsy of a male sibling with thrombocytopenia, which demonstrated normocellular trilineal hematopoiesis with slightly increased small size megakaryocytes, normal flow cytometry; FoundationOne Liquid CDx Next Generation Sequencing testing showed multiple variants of unknown significance seen in 14 different genes including GATA2. Additionally, two younger family members had been investigated for possible ANKRD26-related autosomal dominant thrombocytopenia though no testing was available for review in these cases. The last exacerbation of her chronic thrombocytopenia was 12 years prior during her second pregnancy for which she received intravenous immunoglobulin (IVIg) and steroids with minimal increase in her platelet count but no serious bleeding reported. Since that time, she has required no treatment; her blood counts are monitored every 6 months by her primary care doctor.

Patient received the first dose of SARS-CoV-2 mRNA-1273 Moderna Covid-19 vaccine 2 weeks prior to presentation. One week post receipt the patient experienced mild headaches for which she took three ibuprofen capsules as she is allergic to acetaminophen. The headaches persisted and the patient took sumatriptan with improvement of her symptoms. She had taken ibuprofen and sumatriptan in the past with no adverse events. Also, she had a vaginal ring containing etonogestrel-ethinyl estradiol vaginal ring placed one week prior to hospitalization.

On arrival in the emergency department vital signs were within normal limits. Physical exam was notable for diffuse petechiae of the extremities and trunk along with oral ecchymosis of 1–2 cm; no focal neurological deficits were observed and no hepatic or splenic enlargement was noted. Bloodwork was significant for white blood count (WBC) of 13.1 K/μL, hemoglobin of 13.6 g/dL, hematocrit of 42.1%, and a platelet count of 3000/μL. Prothrombin time and activated partial thromboplastin time were within normal limits. Thus, SARS-CoV2 was not detected on the nasopharyngeal swab and SARS-CoV2 IgG antibodies were reactive. Peripheral smear showed thrombocytopenia without clumping, along with polychromasia and anisocytosis appreciated with some mature neutrophils. A computerized tomography (CT) scan of her head did not show an acute infarct or hemorrhage.

The patient was treated with dexamethasone 40 mg intravenously daily for four days, intravenous Immunoglobulin (IVIG) 1 mg/kg for three days, and was placed on a National Institute of Health (NIH) Stroke Scale monitoring. Platelet count improved to 28 000/μL within 3 days and oral lesions disappeared though some petechiae remained. Her contraception ring was not removed. Patient was discharged with outpatient hematology follow-up.

The majority of research on vaccination related thrombocytopenia (VRT) is concentrated on secondary immune thrombocytopenia after MMR vaccination. Thrombocytopenia developed within 6 weeks in most studies.[1] More than 90% achieve spontaneous resolution within 6 months of onset and <10% progress to chronic thrombocytopenia.[2] Additionally, a number of case report and case–control studies concerning post-influenza vaccination ITP have been published.[3]

Moderna's mRNA-1273 Covid-19 vaccine is a lipid-nanoparticle encapsulated mRNA vaccine, unlike the older vaccines is developed with newer mRNA technology.[4] The nucleoside-modified mRNA after inoculation is transcribed by ribosomes into SARS-CoV2 spike (S) glycoprotein. These spike proteins are displayed by the antigen presenting cells leading to T-cell and B-Cell mediated immunity.[5] The Coronavirus efficiency (COVE) trial, a phase 3, randomized controlled, multicenter trial demonstrated 94.1% efficacy and low rates of serious adverse events when compared to placebo. There were no reported events of thrombocytopenia in the trial, although post vaccination blood work was not mandated.[6]

The temporal sequence of the events suggests an exacerbation of our patient's chronic thrombocytopenia related to the receipt of the mRNA-1273 Covid-19 vaccine. It is possible, but based on reviews of reported side effects unlikely, that the patient's headache medications or her contraception were triggers for this event. Also, improvement of platelet counts despite continuation of combination contraceptive medication, argues against it being causative agent. Fortunately, her symptoms and platelet counts improved though we cannot say definitively whether the treatment with IVIG and steroids, or merely time was the cause. Further investigation into her familial syndrome, close clinical and laboratory monitoring, informed risk/benefit discussions prior to possible receipt of her second Covid-19 vaccination are warranted. To our knowledge, this is the first case in the literature to report worsening underlying thrombocytopenia after receiving Moderna's mRNA-1273 Covid-19 vaccine.

This case report should not be seen as a reason to avoid vaccination but patients with underlying conditions should be monitored closely for any suspicious symptoms following vaccination and have a low threshold for escalating care. It is important to report any complications that may develop from new vaccines to further our knowledge on possible side effects and ways to mitigate potential complications.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Not applicable.

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